


North Coast Watershed Assessment Program

DRAFT

Mattole Watershed Synthesis Report



The mission of the North Coast Watershed Assessment Program is to conserve and improve California's north coast anadromous salmonid populations by conducting, in cooperation with public and private landowners, systematic multi-scale assessments of watershed conditions to determine factors affecting salmonid production and recommend measures for watershed improvements.

Public Review Draft - March 22, 2002

NCWAP General Findings and Discussion

Mattole Basin Issue and Recommendations Synthesis

After conducting public scoping meetings and assessment activities, the NCWAP team compiled and reviewed their list of issues affecting the Mattole Basin. Based upon this review, the team then developed a set of hypotheses to give direction to their scientific inquiry and frame recommendations. The Mattole Basin issues, hypotheses and recommendations applicable to the production of salmon and steelhead are:

Issues:

- Sediment, temperature, pool habitat, escape and ambush cover, and substrate embeddedness in the estuary are thought to be outside of supportive levels for salmonid survival and or production in the estuary.
- Abandoned roads, new road construction, and road maintenance issues related to landsliding and sediment input to streams are concerns in much of the basin.
- High water temperatures are a concern in most parts of the basin.
- High sediment levels are a concern in most parts of the basin.
- Excessive extraction of water during low flow periods is a concern in some parts of the basin.
- Large woody debris recruitment to streams is a concern in some parts of basin.

Hypotheses:

- Summer stream temperatures in much of the Mattole Basin are not within the range of temperatures that fully support healthy anadromous salmonid populations.
- Aggradation from fine sediment in some stream channels has reduced channel diversity needed to fully support anadromous salmonid populations and has compromised salmonid health.
- A lack of large woody debris in some stream reaches has reduced channel diversity needed to fully support anadromous salmonid populations and has compromised salmonid health.
- Some stretches of streams in the basin are not fully supportive of salmonids due to stream flow reductions related to human diversion.
- Sediment and particle size is a function of geologic units' landslide type in the vicinity of the stream.

Recommendations:

- Establish a 24-hour summer water and air temperature monitoring regime and program to detect trends using continuous monitoring thermographs.
- Establish monitoring stations and train personnel to measure and track in-channel fine sediment levels.
- Continue efforts such as road improvements and decommissioning throughout the basin to reduce sediment delivery to the Mattole River and its tributaries.
- Establish systematic programs to address more specific recommendations at the subbasin and stream reach levels.
- Based upon the latest science on placement of large woody debris in stream channels managers in the Western subbasin should work to improve channel structure and function for salmonids.
- Encourage summertime water conservation to improve stream flows and fish habitat.

Table 40: Management Recommendations for the Mattole Subbasins.

Subbasin	Rescue Rearing	Monitor Temperature	Manage for Temperature	Monitor Sediment	Establish Vegetation	Timber Harvest	Increase LWD	Improve Roads	Reduce Diversion
Estuary	X	X		X					
Northern		X	X	X	X	X	X	X	
Eastern		X	X	X	X	X	X	X	
Southern		X		X		X		X	X
Western		X	X	X	X		X	X	

KEY TO FIELDS IN TABLE X:

- **Rescue Rearing** = Rescue rearing effort advised
- **Monitor Temperature** = temperature monitoring program advised
- **Manage for Temperature** = manage areas to reduce solar radiation inputs
- **Monitor Sediment** = sediment monitoring program advised
- **Establish Vegetation** = streamside vegetation planting advised
- **Timber Harvest** = encourage the use of lower impact timber harvest practices
- **Increase LWD** = improve channel structure with large woody debris
- **Improve Roads** = continue road improvements and road decommissioning
- **Reduce Diversion** = reduce unnecessary and wasteful uses of water.

List of Inventoried Streams

The streams listed on the following pages have been inventoried for fish habitat using protocols in the *California Salmonid Stream Habitat Restoration Manual, Second Edition*. Additional streams surveyed since this report was written are available from California Department of Fish and Game, Inland Fisheries Division. The table below includes priority ranking of habitat categories that provide improvement opportunities for each stream based upon the habitat survey and observations. The most urgent concern is assigned a '1', the next highest a '2', etc. "DP" indicates the data are now in the analysis and report process.

Key to fields: **Temp** = summer water temperatures seem to be above optimum for salmon and steelhead; **Pool** = pools are below target values in quantity and/or quality; **Cover** = escape cover is below target values; **Bank** = streambanks are failing and yielding fine sediment into the stream; **Roads** = fine sediment is entering the stream from the road system; **Canopy** = shade canopy is below target values; **Spawning Gravel** = spawning gravel is deficient in quality and/or quantity; **LDA** = large debris accumulations are retaining large amounts of gravel and could need modification; **Livestock** = there is evidence that stock is impacting the stream or riparian area and exclusion should be considered; **Access** = there are barriers to fish migration in the stream.

Table 41: Recommendations Summary for the Mattole River Tributaries.

STREAM	SURVEY LENGTH	TEMP	POOL	COVER	BANK	ROADS	CANOPY	SPAWNING GRAVEL	LDA	LIVESTOCK	ACCESS
MAIN STEM MATTOLE (50)											
NORTHERN SUBBASIN											
SULPHUR CREEK	7137	1	4	5	2	3	6				
UNNAMED TRIBUTARY TO SULPHUR CREEK	598		4	5	1	2+++	6	3			
UNNAMED TRIBUTARY #2 TO SULPHUR CREEK	2632		1	2	3	4	5				
CONKLIN CREEK	3163	1	6	7	4	5	2			3	
OIL CREEK	16,530	2	1	3	5		6		4		
GREEN RIDGE CREEK	3710		1	2	3						
DEVIL'S CREEK	7334		1	2	3						
RATTLESNAKE CREEK	22,234	1	2	3	4		5				
EASTERN SUBBASIN											

STREAM	SURVEY LENGTH	TEMP	POOL	COVER	BANK	ROADS	CANOPY	SPAWNING GRAVEL	LDA	LIVESTOCK	ACCESS
DRY CREEK	8548	1	6	4	3	5	2				
MIDDLE CREEK	7475	6	5	4	1	2	3				
WESTLUND CREEK	16,979	5	3	4	1	2			6		
GILHAM CREEK	9992		5	3	1	2	7	4	6		8
UNNAMED TRIBUTARY TO GILHAM CREEK	3051		4	3	1	2	6	5			
FOURMILE CREEK	15,566	1	5	6	3	4	2		7		
UNNAMED TRIBUTARY TO FOURMILE CREEK	6187	1	5	6	3	4	2	7			
SHOLES CREEK	21,247	7	4	1	2	3	6		5		
HARROW CREEK	1222		6	5	3	4	7	1	2		
LITTLE GRINDSTONE CREEK	2991	1	2	3	4	5	6		7		
GRINDSTONE CREEK	13,772	1	4	5	3	6	2		7		
FIRE CREEK	10,723	1	6	5	3	2	4		7		
EUBANKS CREEK	17,556	4		2	3				1		
MCKEE CREEK	11,779		1	2	3	4					
PAINTER CREEK	1616	1	2	3			4				
SOUTHERN SUBBASIN											
HEADWATERS OF THE MATTOLE RIVER	35,199	1			2	3					
BRIDGE CREEK	16,467	1	2	3	4	5					
WEST FORK BRIDGE CREEK	7386	1	2	3	4	5			6		
SOUTH BRANCH WEST FORK BRIDGE CREEK	7456	6	2	3	4	5			1		
VANAUKEN CREEK	7456		1		2	4			3		
SOUTH FORK VANAUKEN CREEK	449	1	2	3	4	5					
ANDERSON CREEK	5012	1	2	3	4						

STREAM	SURVEY LENGTH	TEMP	POOL	COVER	BANK	ROADS	CANOPY	SPAWNING GRAVEL	LDA	LIVESTOCK	ACCESS
MILL CREEK (UPPER MATTOLE RIVER)	934		2	1	3	4					
STANLEY CREEK	5076	1	4	5	2	3			7		6
BAKER CREEK	11,852		1	2				3			
THOMPSON CREEK	17,337	1		3	4	5			2		
YEW CREEK	3444			1	2	3					
HELEN BARNUM CREEK	5012	1	2								
LOST MAN CREEK	6112		2						3		1
UNNAMED TRIBUTARY TO LOST MAN CREEK	6558		1						2		
WESTERN SUBBASIN											
MILL CREEK (LOWER MATTOLE RIVER)	5805		2	1	4	3					
SQUAW CREEK	21,506	1		5	3	4	2				
HONEYDEW CREEK	23,178	4	1	2	3		5				
BEAR TRAP CREEK	9883	3	1	2			4				
LOWER EAST FORK HONEYDEW CREEK	15,231	2	6	5	1	4	3				
UPPER EAST FORK HONEYDEW CREEK	5514	1	3	4	5		2				6
WEST FORK HONEYDEW CREEK	3897	2		3	4		5				1
BEAR CREEK	38,174	1	3	4			2				
NORTH FORK BEAR CREEK	17,774	1	6	3	5		2		4		
UNNAMED TRIBUTARY TO NORTH FORK BEAR CREEK	9252		3	2	4						1
SOUTH FORK BEAR CREEK	63,155	1	5	2	3				4		
NOONING CREEK	7948	4	2	1					3		

*DP = Data Pending

Limitations of this Assessment

This watershed assessment provides useful and valuable information and represents a considerable effort of the involved agencies, contractors, and public. It was limited in duration, scope, detail, and analysis level due to constraints in budget, time, access, and overall resources. Where data are limited, hypotheses were developed along with recommendations to test or improve our understanding of watershed processes. Specific limitations are presented below to put the assessment in context. To the extent possible, we will address these limitations during the preparation of the final draft of this assessment, scheduled to be completed May 2002.

- Point or more local data, e.g., individual stream reaches, were described in relation to those smaller geographical areas. As descriptions and inferences are drawn from those data to a more regional, watershed scale the certainty associated with those conclusions and inferences is reduced. In those cases, the NCWAP team offered working hypotheses with suggestions for testing or improving the level of certainty.
- The DMG's landslide and geomorphic analyses were limited to aerial photo interpretation from varying sets of photos and limited verification. Limited aerial photo coverage does not bracket temporal distribution of important watershed events, which may not be evident in photos taken years after the fact.
- Imagery from 1965 was only partly reviewed. Due to access, time, budget, and staffing constraints, field checking of interpretations did not occur.
- The geologic analysis did not identify erosion sources beyond mass wasting and gullying, such as surface erosion or erosion induced by human activities.
- At the analysis scale of 1:24,000, the detection of geologic features smaller than 100 feet in greatest diameter is poor.
- Localized point source channel aggradation and meandering flows observed shortly after the 1964 storms were not systematically compared sequentially through time to detail evolving stream channel morphology.
- The DMG's channel classification was done based on channel gradients taken from a Digital Elevation Model. This model was based on imperfect topographic data. Most of the basin topography is mapped at a contour interval of 80 feet, which is too coarse to adequately interpret the gradient of individual reaches. No field stream gradient surveys were done for this assessment, due to time and budget constraints.
- The DMG analysis of fluvial and hillslope conditions has not been completed. Collected data is not completely converted into a digital format needed for spatial analysis. This includes the DMG's Landslide Potential Map, fluvial geomorphic characteristics, and spatial data from NCWQCB, DFG, DWR, and CDF. The DMG has not reviewed all documents referenced in this report.
- There was only time to compare broad contrasts between land use impacts and habitat conditions.

- The NCRWQCB's water chemistry analysis was limited to available USEPA StoRet data for the period 1973 to 1988 at one location, and samples obtained by the NCRWQCB at four locations for two sampling events in 2001. The sampling frequency was scattered and discontinuous and did not allow for much detailed temporal analysis.
- Data on pesticide occurrences in surface water were not available from StoRet, private interests, nor collected in the NCRWQCB sampling of 2001.
- The temperature range used for "proposed fully suitable" of 50-60° F was developed as an average of the needs of several cold water fish species and life stages, including chinook and coho salmon, and steelhead and cutthroat trout. As such, the range does not represent the slight variance of fully acceptable ranges for particular species.
- In-channel data and some temperature data were provided as summary statistics (medians, means, maxima), limiting the ability to factor variability into the analysis, and not allowing for independent checks on the data quality. As such, the analyses and subsequent assessment are limited in scope.
- Temperature data analysis did not include probability of exceedance from cumulative distribution plots, nor hours of exceedance of a threshold. This analysis was limited by not having raw data for all sites, obtaining raw data late in the analysis, and data interface problems.
- The NCRWQCB did not have acceptably useful turbidity or suspended solids data, though considers them critical to watershed analysis. The absence of useful data and any analysis of suspended loads and turbidity are limitations in this assessment. These data sets exist, but were for one surface sampling location only and were not used in the 2002 assessment.
- Analysis of temperature information is without knowledge of the extent of a thermal reach upstream of the continuous data logger.
- The 1994 vegetation data used in this report will be replaced by more accurate 1998 vegetation data during the public review period. Some changes in analysis results are expected.
- Historic timber harvesting data is compiled from previous work performed by the Mattole Restoration Council. The CDF has not yet validated the accuracy of this data.
- Although the DFG has surveyed in excess of 120 miles of anadromous reaches in the Mattole, there are a few, most importantly Mattole Canyon Creek and the Lower North Fork, that could possibly identify opportunities for local improvements for fish. Extensive stream surveys will strengthen the stewardship effort.
- Most of the DFG surveys used for this NCWAP stream reach assessment were conducted in 1996. A few more recently, and three nearly ten years ago. Although most of the channel characteristics remain relatively constant, components like habitat complexity and riparian shade canopy can change fairly quickly. Current surveys would contribute to the data relevance and help track change to the streams in a timely manner.
- The EMDS model used is preliminary; not all components of the model are currently in use due to data and modeling issues (i.e., stream temperature, fish passage, stream flow); not all data layers used in the model have yet been fully subjected to quality control review; scientist and practitioner peer review of the model is planned but not yet completed.